



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/622,931	11/13/2000	Yoshiki Nakagawa	1581/00210	5489
7590	09/24/2004			
			EXAMINER	
			ZALUKAEVA, TATYANA	
			ART UNIT	PAPER NUMBER
			1713	

DATE MAILED: 09/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/622,931	NAKAGAWA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Tatyana Zalukaeva	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 20 July 2004.  
 2a) This action is **FINAL**.      2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-3,5,8-10,12-17 and 19-34 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-3,5,8-10,12-17 and 19-34 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 1-3, 5, 8-10, 12-17, 19-34 are pending.

### ***Claim Objections***

3. Claim 31 is objected to because of the following apparently the order of words in claim 32 is inappropriate and this makes the claim almost incomprehensible. Appropriate correction is required.

4. Claim 1 has been amended to introduce the new range for polydispersity, i.e. not more than 1.3.

5. Claims 1-3, 5, 8-10, 12-17, 19-23, and 30- 34 are rejected under 35 U.S.C. 102(b) as being anticipated by or in the alternative as obvious over Matyaszewski et al (U.S. 5,807,937) .

Disclosed are preferred telechelic homopolymers obtained by living radical polymerization include those of styrene, **acrylonitrile, C1 -C8 esters of (meth)acrylic acid**, vinyl chloride, vinyl acetate and tetrafluoroethylene. Such telechelic homopolymers preferably have either a weight or number average molecular weight of at least 250 g/mol, more preferably at least 500 g/mol, even more preferably at least 1,000 g/mol, and most preferably at least 3,000 g/mol, and/or have a polydispersity of 1.50 or less, **more preferably 1.3 or less, even more preferably 1.2 or less and most preferably 1.15 or less**. Polymers and copolymers of Matyaszewski most

preferably have polydispersity less or equal to 1.10 (col.38, lines 60-65). It is taught by Matyaszewski that one can select an initiator that provides the same structure as a repeating polymer unit (lines 65-67 in col.38). Matyaszewski discloses a method of atom transfer radical polymerization (ATRP), as a kind of a living polymerization process in particular application to the process of making end functional and telechelic polymers (see abstract, figure 1, col.25, lines 31-35, col. 26, lines 5-56, etc.)

Matyaszewski discloses a variety of suitable polymers, including acrylates, methacrylates, styrene and other vinyl polymers, terminated by a variety of functional groups, including acryloyl groups, as can be derived from the meaning of X explained through the whole body of a patent). The range of molecular weights and molecular weight distributions of Matyaszewski's end-functional and telechelic polymers are within the instantly claimed range (see, for example col. 26, lines 44-56). It is further taught by Matyaszewski that the end functionality of polymers can be easily converted to other functional groups, and initially containing CO<sub>2</sub>R group is identified as an initial functional group. With regard to claims 8-10, metal complex catalyst utilized by Matyaszewski is preferably a copper complex. The end functionality of the copolymers of Matyaszewski can be easily converted to other functional groups, including acryloyl groups by any conventional and known methods (col. 39, lines 15-25). Polymers can be prepared using water as a medium, utilizing an emulsion polymerization (col. 39, lines 43, 44). The rejection of claims. With regard to the claims directed to a product obtained by ATRP having specific functional groups (claims 1-3, 5, 8-10) the rejection is made in the sense of In re Shaumann, 572 F.2d 312, 197 USPQ 5 (CCPA 1978). When the reference

teaches a small genus which places a claimed species in the possession of the public, the species would be obvious even if the genus were not sufficiently small to justify a rejection under 35 U.S.C. 102.

Therefore, the generic teaching of polymers, having end functional group as discussed above necessarily indicates, that any acryloyl functional group containing polymer, having recurring acrylate monomer units would have been operable within the scope of Patentees invention. Therefore it would have been obvious to a skilled artisan at the time the invention was made to arrive at the claimed subject matter, because it appears that the claimed subject matter is within the scope of generic teaching of Matyaszewski.

6. Claims 24-29 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Matyaszewski in view of Fifield (U.S. 5,381,735).

Matyaszewski discloses acryloyl group end functional vinyl polymers, which are components for curable compositions. However, the above reference do not specify photocuring by means of actinic rays or photopolymerization initiators.

Actinic radiation and photoinitiators are well known to those skilled in the art for curing polymeric compositions.

Thus Fifield discloses photopolymerizable composition comprises a photopolymerizable material having ethylenically unsaturated bonds available for participation in addition (free radical) polymerization. Prepolymers, of Fifield are those having olefinic bonds at the termini of the chain are subsequently further polymerized by use of **actinic radiation**. (col.4, lines 24-35)

The termini of the prepolymer chain are typically "capped" via an ester or carbamoyl (urethane) linkage with an olefinic moiety such as an acrylate or methacrylate. (col. 4, lines 43-46). The composition can be also thermally cured with the use of thermal initiators (col. 7, lines 45-50).

Since Matyszewski suggests curing or crosslinking a composition comprising a polymer having terminal functional group, and Fifield specifies the details of curing process for the similar compositions one skilled in the art would have reasonably expect that the conventionally known techniques of photopolymerization are operable within the scope of Matyszewski inventions with the reasonable expectation of success.

Therefore, the combination of references renders the above claims prima facie obvious and properly rejected under 35 USC 103(a).

### ***Response to Arguments***

7. Applicant's arguments filed 07/09/04 have been fully considered but they are not persuasive.

Applicants argument resides in contention that Matyasawski does not overcome the differences, i.e. Matyasawski fails to even remotely suggest a vinyl polymer having a Mw/Mn of not more than 1.3. This is not found persuasive because Matyasawski expressly teaches the polydispersity of polymers of less than 1.3. (see Fig. 5A, 6A, , 7A, 8A, 9A, col.20, lines 63, 64, , especially col.26, lines 44-57, etc).

Applicants arguments with regard to anticipation and sustainability of 103 rejection as an alternative to 102 rejection over Matyasawski are also not persuasive per reasons set forth in applicable citations from *In re Shaumann* for genus/species situation and *In re Thorpe* for product by process claims.

Arguments on Randen reference are moot, since the reference is removed from the scope of present rejection.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tatyana Zalukaeva whose telephone number is (571) 272-1303. The examiner can normally be reached on 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tatyana Zalukaeva  
Primary Examiner  
Art Unit 1713

September 22, 2004

